5440-14 Computer Science

The holder is authorized to teach computer science in grades 7-12

In order to qualify for this endorsement, the candidate shall demonstrate the following:

Knowledge Standards:

Demonstrates knowledge of essential computer science concepts and skills including:

Program and algorithm design; data structures; object-oriented program design; and high level languages

Computer hardware architecture

Programming languages, including the definition and structure of languages and comparison of existing high level languages

Fluency in at least two high level languages used in current pedagogy

The function, application, capabilities, and limitations of computers

The social and ethical implications of computers and their related technology

The mathematical principles which are the basis of many computer applications including algebra, set theory, coordinate systems and graphs, matrices, and probability and statistics

The concepts, vocabulary, and issues found in two or more of the sub-disciplines of computer science (including but not limited to: computer architecture; artificial intelligence; data and knowledge bases; ethics; graphics; human-computer interaction; networks and data communication; programming languages; and software engineering)

The specification, design, implementation, testing, modification, and debugging of software

Performance Standards:

Implements an inquiry-based computer science curriculum that integrates conceptual understanding and skill development. Specifically, the educator:

Designs and implements instructional activities for students that reinforce the topics, concepts, and skills central to computer science listed above

Develops appropriate assessment criteria for student developed software based on software quality attributes (e.g. reusability, maintainability, testability, etc.)

Designs and implements activities which reinforce verbal and written technical communication skills

Recognizes and supports creative and alternative solutions